SONY

STEREO CASSETTE DECK

TC-V7

OPERATING INSTRUCTIONS

Before operating the unit, please read this manual thoroughly.
This manual should be retained for future reference.

English

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

For the Customers in the United Kingdom

The mains lead plug of this apparatus is a 2-pin type designed to be connected only to other apparatus equipped with a suitable socket outlet. If the plug cannot be used in this way, cut off the plug and fit an appropriate one as follows.

Important
The wires in the mains lead are coloured in accordance with the following code :

Blue : Neutral
Brown : Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows :
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

WARNING
To prevent shock hazard, do not insert the plug cut off from the mains lead into a socket outlet. This plug cannot be used and should be discarded.

TABLE OF CONTENTS

FEATURES

Auto-reverse playback with roto-bilateral record/playback head
Continuous playback of both sides of the cassette is possible without turning the cassette over. When the tape reaches its end, the roto-bilateral record/playback head reverses position and the other side will be played back automatically. The side being played back can be changed instantly during playback, by simply pressing the forward or reverse play key. The ► or ◄ indicator shows the playback direction.
The roto-bilateral head assures the same performance characteristics in either tape transport direction.

Newly-developed LA (LaserAmorphous) head
The record/playback head is made of a special amorphous magnetic alloy developed by Sony, and its cores are solidly welded by laser. This new highly durable head provides a wider dynamic range and a more extended frequency response, especially in the high-frequency range. The head is designed to take full advantage of the potential of metal tapes.

Slim cabinet
Touch a button and the cassette module slides smoothly out. The use of this cassette module with a linear-skating power loading mechanism makes it possible to reduce the height of the cabinet to 70 mm.

Blank skip function
Blank spaces of at least 10 seconds long can be skipped in either fast-forward or fast-reverse mode so that only the recorded portions of the tape are played back.

AMS (Automatic Music Sensor)
The AMS locates a selection as far ahead as 9 selections or as far back as 8 selections, and plays the selection back automatically.

Cycle play
Using the ⟲ cycle key, both sides of the cassette can be played back five times in succession.

Other useful functions
●The newly-developed C-type Dolby NR system which reduces tape noise twice as effectively as the conventional B-type system is incorporated.
●The digital linear counter indicates the elapsed recording or playback time in minutes and seconds, and indicates the recording time remaining with a minus sign.
●The peak level meters, digital linear counter, and other indicators in use are all displayed in the bright FL-display window.
●The automatic tape select system adjusts the cassette deck to the optimum recording and playback characteristics for each tape type.
●A timer switch is provided to turn the deck on and off at times preset on an optional timer.
●Various remote control operations are possible using the optional RM-70 remote control unit, the RM-65 synchro remote control unit (for synchronized operation with the turntable) or the ST-V7/V7L system control tuner (for remote control of the audio system).

OPERATING VOLTAGE

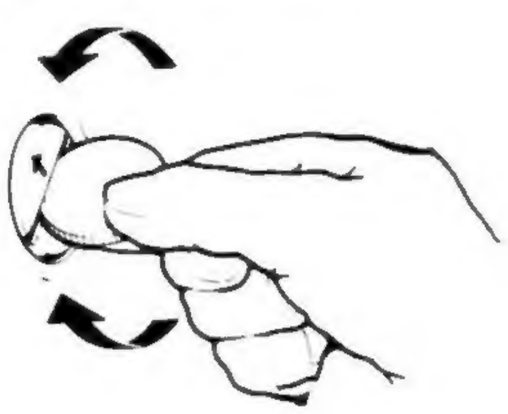
Before connecting the unit to the power source, check that the operating voltage of your unit is the same as the local power line voltage.

The Continental European model (Type 1) operates on 220 V ac (or 240 V ac adjustable by authorized Sony personnel).

The United Kingdom model (Type 2) operates on 240 V ac (or 220 V ac adjustable by authorized Sony personnel).

The Canadian model (Type 3) operates on 120 V ac.

The model for other countries (Type 4) operates on either 110, 120, 220 or 240 V ac. The voltage selector is located on the rear panel. If the selector must be reset, **disconnect the ac power cord** and turn the selector with a coin so that the arrow on the selector points to the appropriate voltage.



PRECAUTIONS

On safety

- Before operating the unit, check that the operating voltage of your unit is identical with that of your local power supply.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

On installation

- Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with sufficient air circulation.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or mechanical vibration.
- Install the unit with the front panel facing toward you. Do not install the unit in an inclined position.

On head cleaning

The performance of your unit is dependent on the periodic cleaning of the heads and all surfaces over which the tape travels.

Dirty heads and a dirty tape path cause:

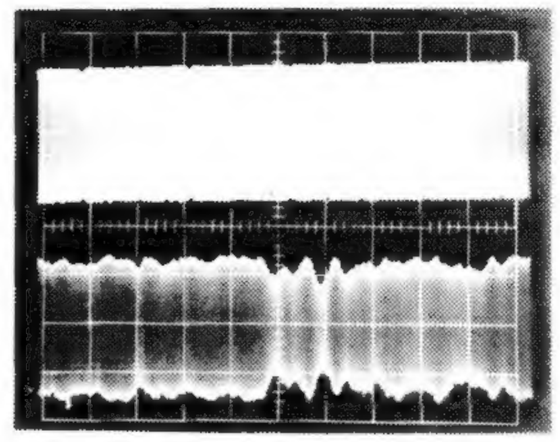
Loss of high frequency response
Loss of sound volume
Sound drop-outs

The heads and tape path should be cleaned after 10 hours of operation. For details, see "Maintenance" on page 17.

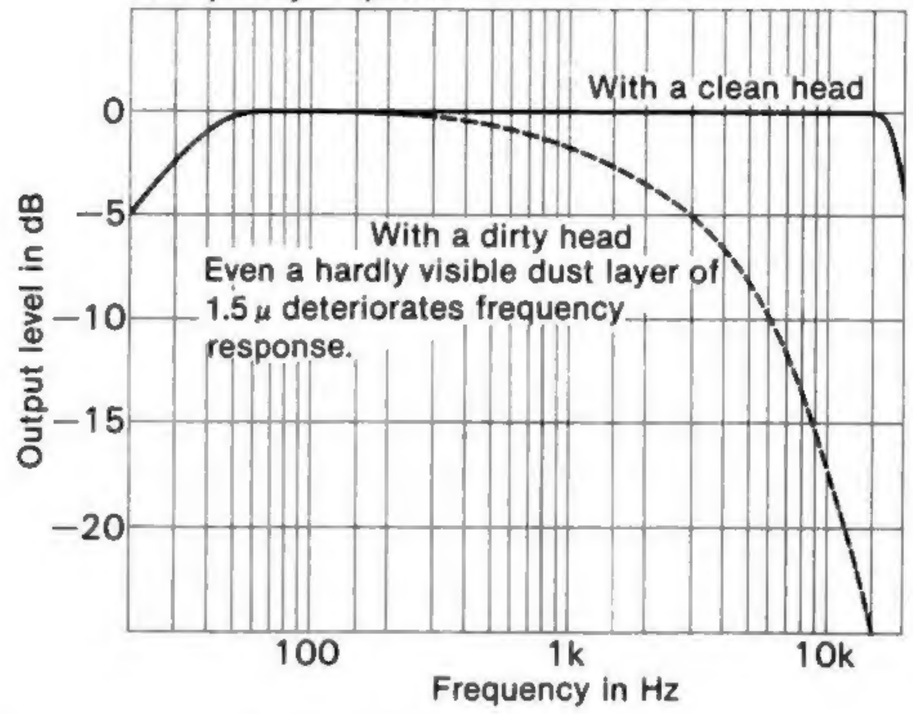
Playback waveform at 10 kHz

With a clean head

With a dirty head (The output level fluctuates.)



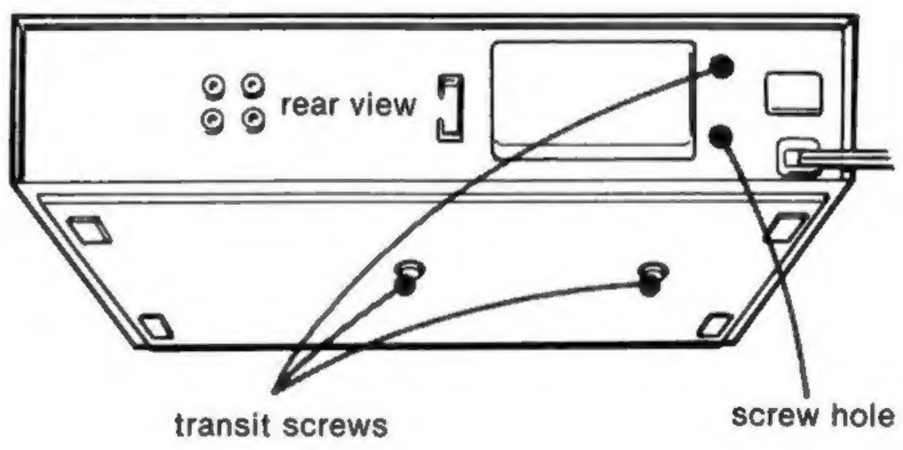
Frequency response



REMOVAL OF THE TRANSIT SCREWS

The cassette module is secured with three red transit screws to prevent it from sliding out while the unit is being transported.

Before operating the unit, be sure to remove the transit screws with a coin or a screwdriver. Save the screws and put them back in the original positions when transporting the unit.



Note

After the screws have been removed, be careful not to hold the unit so that the front panel faces down, since the cassette module may slide out.

FUNCTION OF CONTROLS

The numbers in the photos and illustration on page 5 are keyed to the following explanations.

❶ POWER switch
This turns the power on or off. The tape direction indicator and the display window will light up when the unit is turned on.

❷ Tape direction indicators
The ► (forward) indicator illuminates when the upper side of the cassette is selected.
The ◄ (reverse) indicator illuminates when the lower side is selected.

❸ ▲ OPEN/CLOSE button
Press this button and the cassette module automatically slides out. Press it again and the module closes.

❹ Function keys
It is possible to switch directly from one mode to another. The indicator lamps light when the tape deck is in the forward, reverse play, record or pause mode.

- ◄◄ **AMS (fast-reverse/AMS) key:** Press this key to advance the tape rapidly to the left. This key is also used for "AMS" (page 13) and "Auto play" (page 14).
- ◄ **(reverse play) key:** Press this key to play back the lower side of the cassette. The tape is transported to the left.
- ► **(forward) key:** Press this key to play back the upper side of the cassette. The tape is transported to the right. To record, press this key while holding the ● REC key down.
- ►► **AMS (fast-forward/AMS) key:** Press this key to advance the tape rapidly to the right. This key is also used for "AMS" (page 13) and "Auto play" (page 14).
- ● **REC (record) key:** Press this key together with the ► key to start recording. Also press this key before adjusting the recording level.
- ■ **(stop) key:** To stop the tape, press this key. The tape will stop automatically when it is completely wound in either direction.
- II **PAUSE key:** To pause for a moment during recording or playback, press this key. This key is also used to control more precisely the start of recording and to release the record muting mode.
- O **REC MUTE (record muting) key:** Press this key to eliminate unwanted material and to insert a blank space during recording. See "Record muting" on page 16.

❺ REC LEVEL (recording level) controls
These controls adjust the recording level. The upper slide bar is for the left channel and the lower for the right channel.

❻ BLANK SKIP key
Press this key to skip blank spaces of at least 10 seconds long during playback. See page 13.

❼ ⊂⊃ cycle key
Press this key to play back both sides of the cassette five times in succession. See page 12.

❽ AMS and CLEAR keys
Use these keys to set the number of selections to be skipped in AMS operation. Every time the AMS key is pressed, the number increases by 1 up to 9. To cancel the AMS operation, press the CLEAR key.

❾ COUNTER MEMORY key
Press to rewind the tape to the "0.00" point on the tape counter. The word "MEMORY" is displayed below the tape counter. Pressing the ► key together with the ◄◄ key or the ◄ key with the ►► key automatically starts playback from "0.00."
When you do not use the memory function, press this key again. The word "MEMORY" will disappear.

❿ COUNTER RESET key
Press this key to reset the tape counter to "0.00."

⓫ TIMER switch
You can set the unit to record or play back at a predetermined time by connecting any commercially available timer. To record, set this switch to REC. To playback, set it to PLAY. See "Timer-activated recording and playback" on page 16.

⓬ REMOTE control connector
Connect the optional RM-70 remote control unit or ST-V7/V7L system control tuner to operate the tape transport functions from a distance. Synchronized operation is also possible with selected Sony turntables, using the optional RM-65 synchro remote control unit. Read the instruction manual of your remote control unit before operating it.

⓭ TAPE SELECT switch
Generally set this switch to AUTO. The automatic tape select system will then operate. When using a TYPE III (Fe-Cr) cassette or a TYPE IV (METAL) cassette which has no METAL tape detector slots, set this switch to the III Fe-Cr (IV METAL) position. See page 10.

⓮ DOLBY NR* switch
To record or play back using the Dolby B-type NR system, set this switch to B-TYPE. To record or play back using the Dolby C-type NR system, set the switch to C-TYPE.
The corresponding indicator lights up in the display window.
To record or play back without the Dolby NR process, set the switch to OFF.
For details about the Dolby NR system, see page 18.

* "Dolby" and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

⓯ Tape counter
This counter indicates the tape running time.
See "Using the digital linear counter" on page 15.

⓰ Peak level meters
These meters show the peak input level of each channel during recording, and recorded levels in the playback mode. They follow the transient peaks of high-level inputs that are too brief to be followed by conventional VU meters so that the optimum recording level can be accurately set.

⓱ Tape type indicators
When a cassette is inserted, one of the tape type indicators lights up depending on the type of tape and the position of the TAPE SELECT switch.

⓲ DOLBY NR indicator
The Dolby NR system selected by the DOLBY NR switch is indicated.

⓳ BLANK SKIP indicator
This indicator lights up when the BLANK SKIP key is engaged.

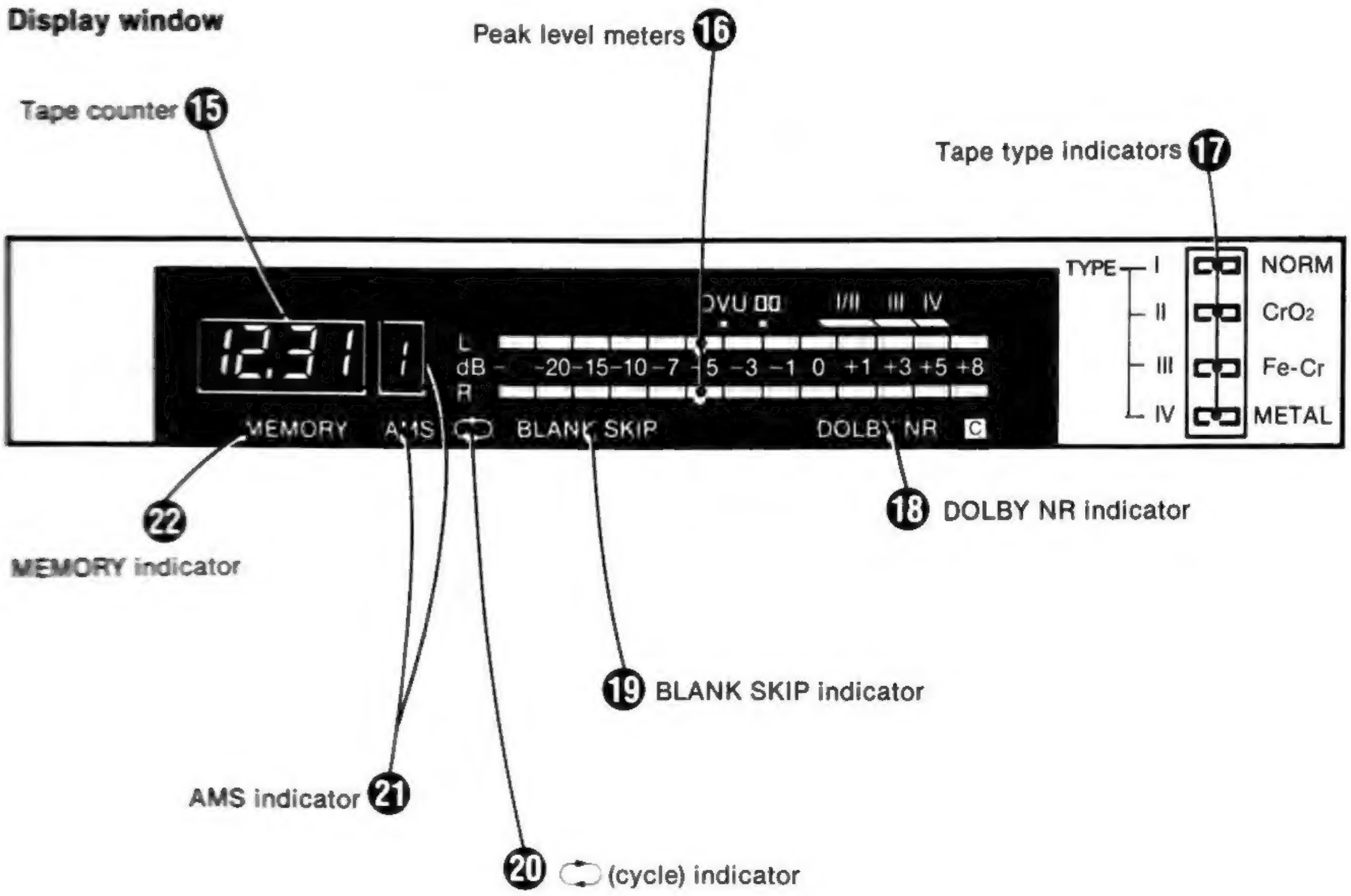
⓴ ⊂⊃ (cycle) indicator
This indicator lights up when the ⊂⊃ key is engaged.

㉑ AMS indicator
This indicator shows how many selections will be skipped with the AMS system.

㉒ MEMORY indicator
This indicator lights up when the COUNTER MEMORY key is engaged.

ISS (interference suppress switch) (on the bottom)
Used for recording MW or LW programs. See page 9.

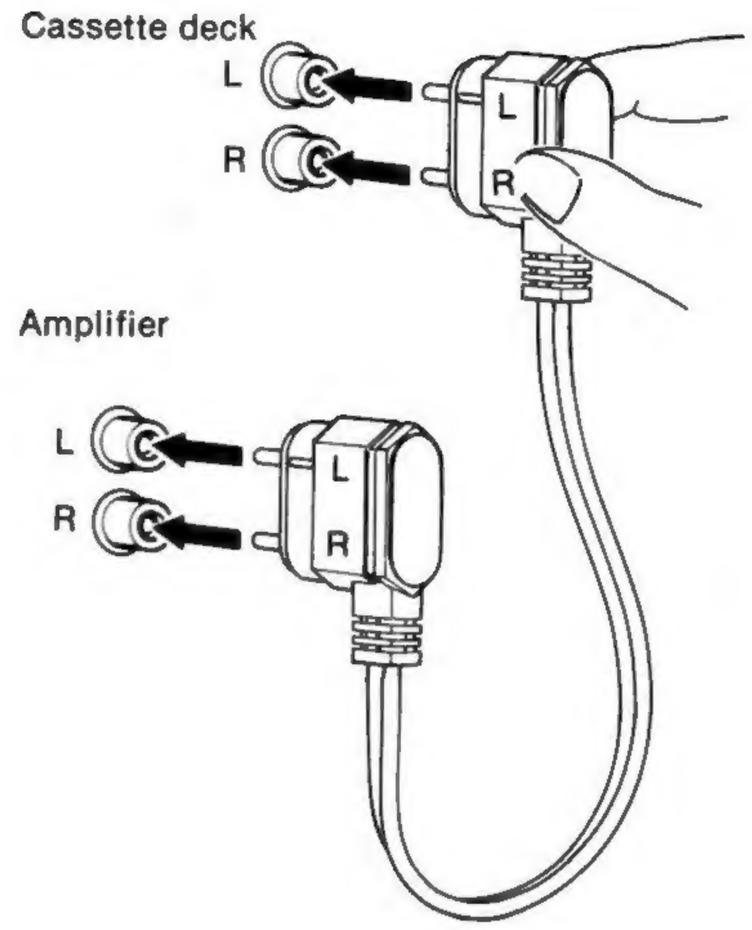
Display window

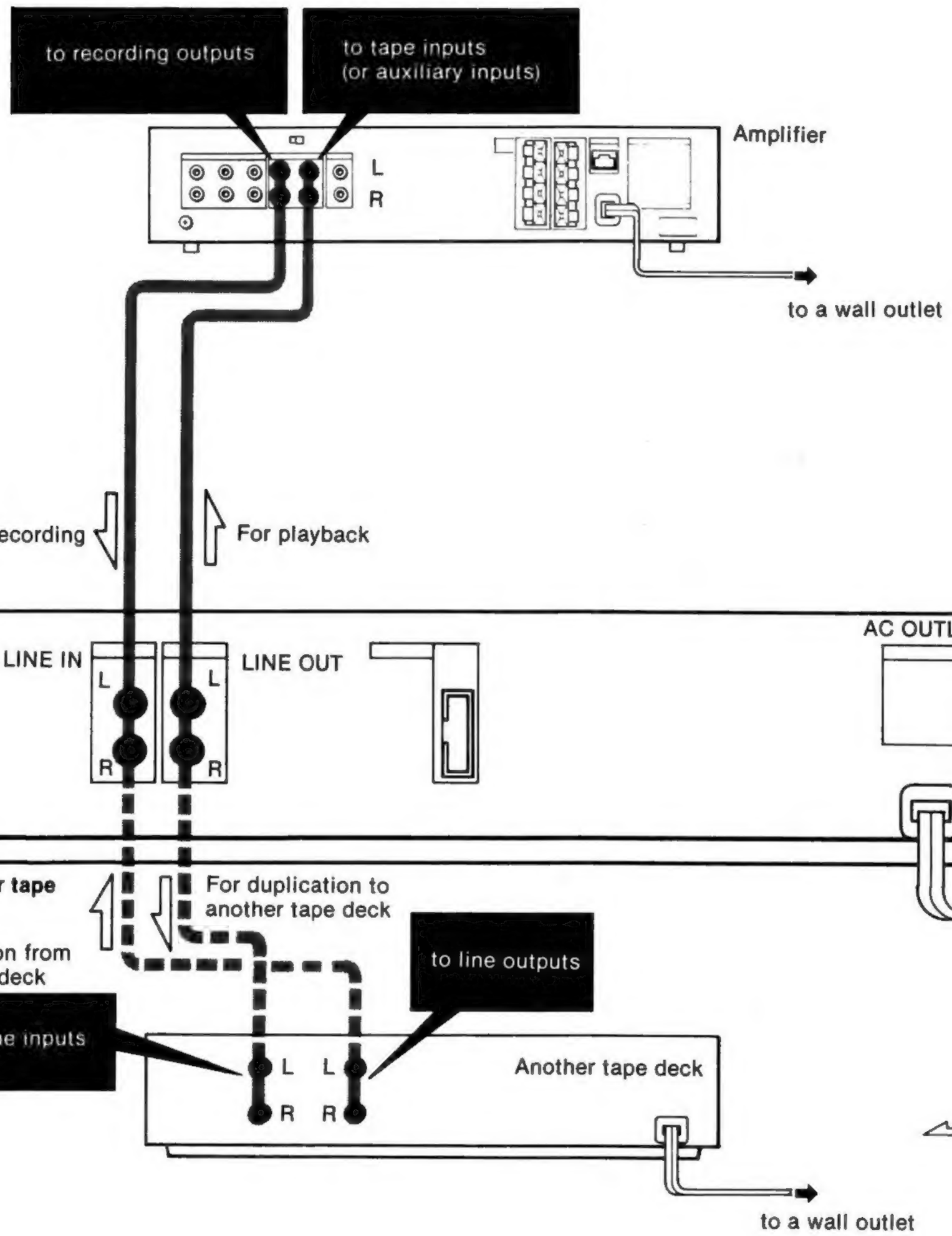


CONNECTIONS

Notes

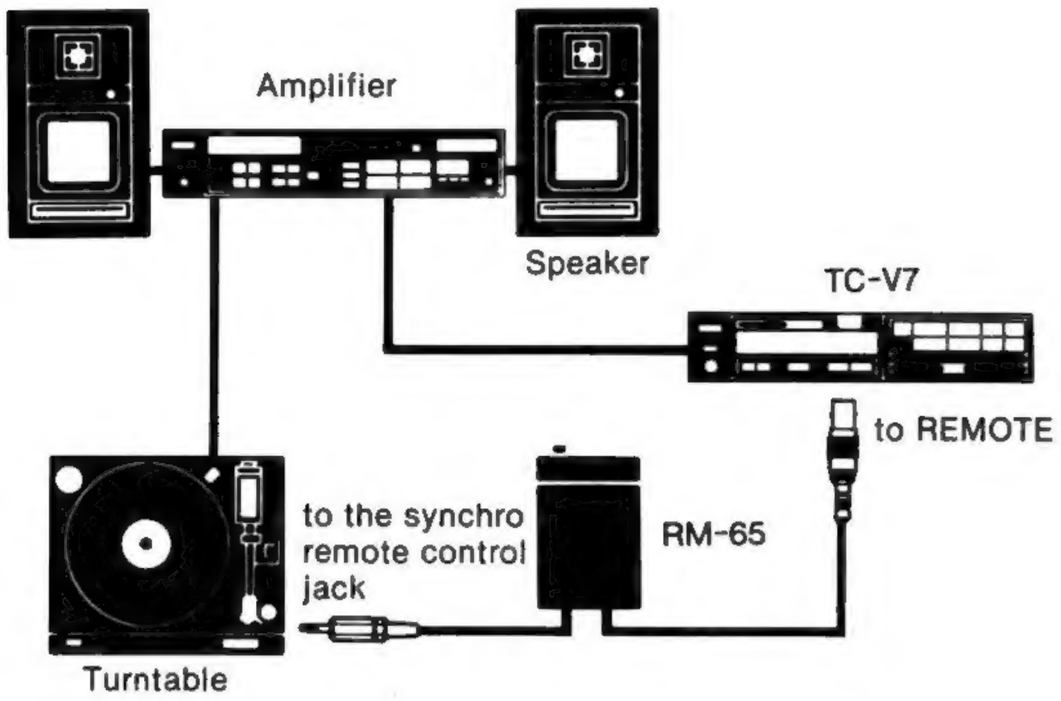
- Turn the amplifier off before making any connection.
- Be sure to insert the plugs firmly into the jacks. Loose connections may cause hum and noise.
- The L pin of the supplied connecting cord should be connected to the L jack (L: left channel) and the R pin to the R jack (R: right channel) as illustrated.





Synchronized operation using the optional RM-65 synchro remote control unit

When this cassette deck is connected to a turntable equipped with a synchro remote control jack using the RM-65, the operation of the cassette deck and the turntable will be synchronized.
For more details refer to the instruction manuals of the RM-65 and the turntable.

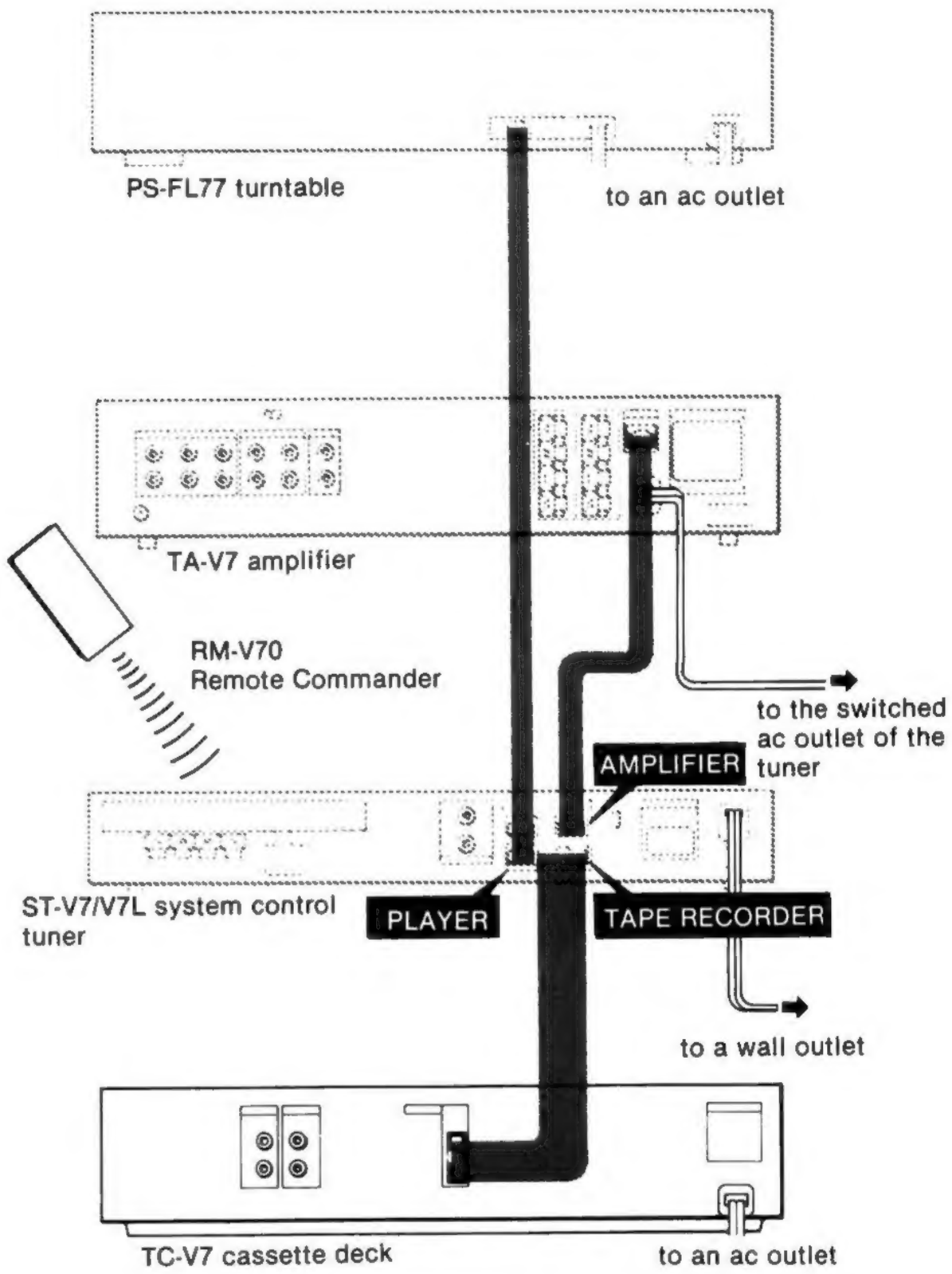


AC outlet (not equipped with the type 4 model)

Use to supply ac power to other audio components. For the type 1 and 3 models, this outlet is independent of the tape deck POWER switch. For the type 2 model, this outlet is controlled by the tape deck POWER switch. Maximum rated capacity is 100 W.

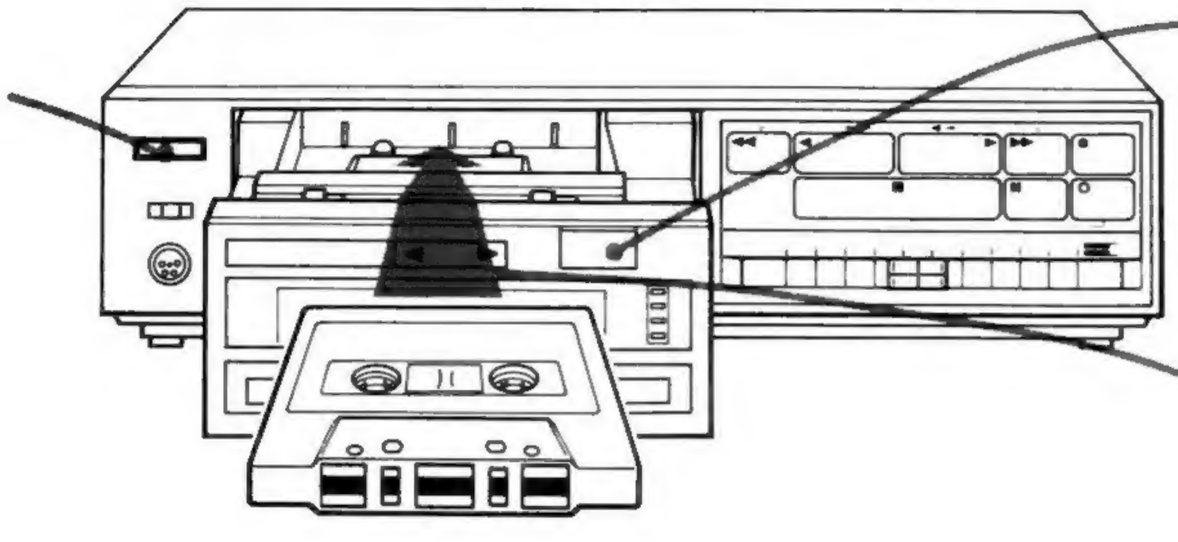
Remote control operation using the ST-V7/V7L system control tuner

Connect this cassette deck to the ST-V7/V7L system control tuner (optional) using the remote control cable supplied with the ST-V7/V7L. The ST-V7/V7L, with its infrared ray sensor, can control various operations of the cassette deck as well as the operations of the connected amplifier and turntable by an infrared ray transmitted from the RM-V70 Remote Commander (supplied with the ST-V7/V7L). For details, refer to the ST-V7/V7L's instruction manual.



CASSETTE INSERTION

1 Depress the POWER switch to ON.

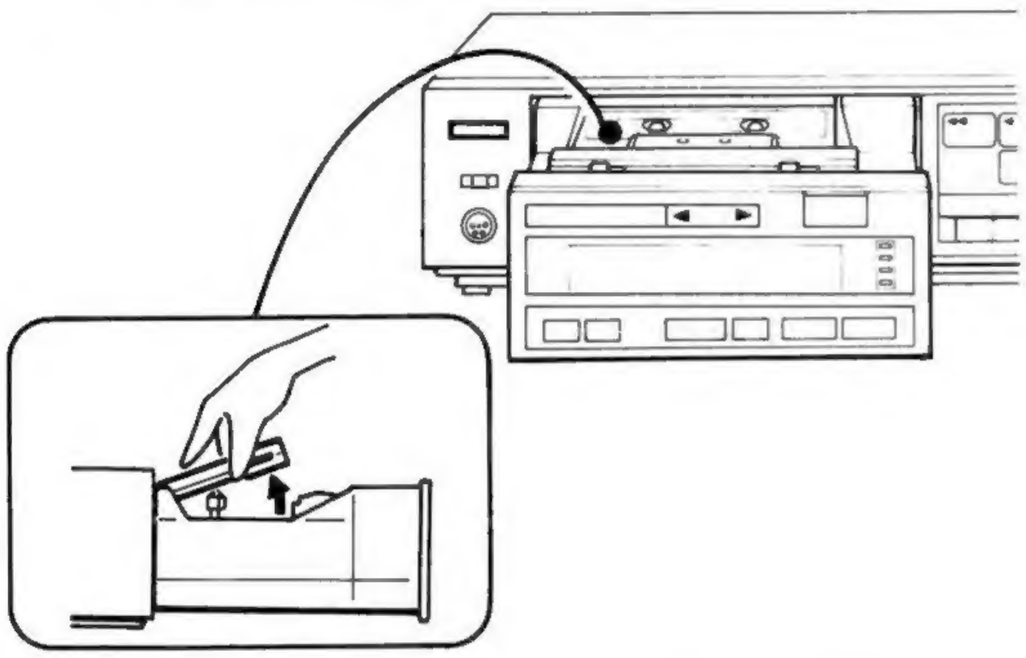


2 Press the ▲ OPEN/CLOSE button to open the cassette module.

3 Insert a cassette with the tape surface toward you. First insert the cassette fully inward, then press it down until it clicks.

To remove the cassette

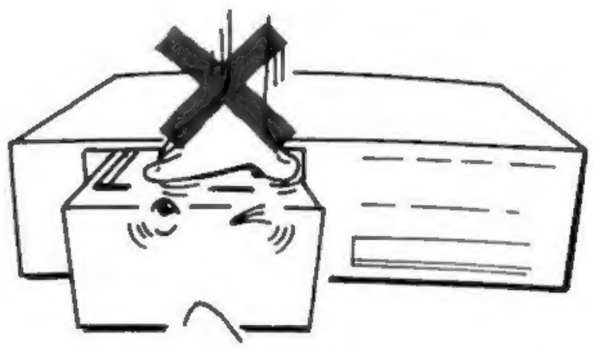
Press the ■ (stop) key and the ▲ OPEN/CLOSE button, and take the cassette out by hand as illustrated.



To close the cassette module, press the ▲ OPEN/CLOSE button again.

Notes on the cassette module

- If something should be caught between the module and the cabinet when the module is moving, the module will automatically stop. Press the ▲ OPEN/CLOSE button to move the module in the opposite direction and after removing the object, press the ▲ OPEN/CLOSE button again.
- Do not pull, push in, or push down on the module.



- Moving the module during recording or playback is not recommended, since this may affect the tape transport.
- Place the cassette deck on a level surface for proper cassette module movement.

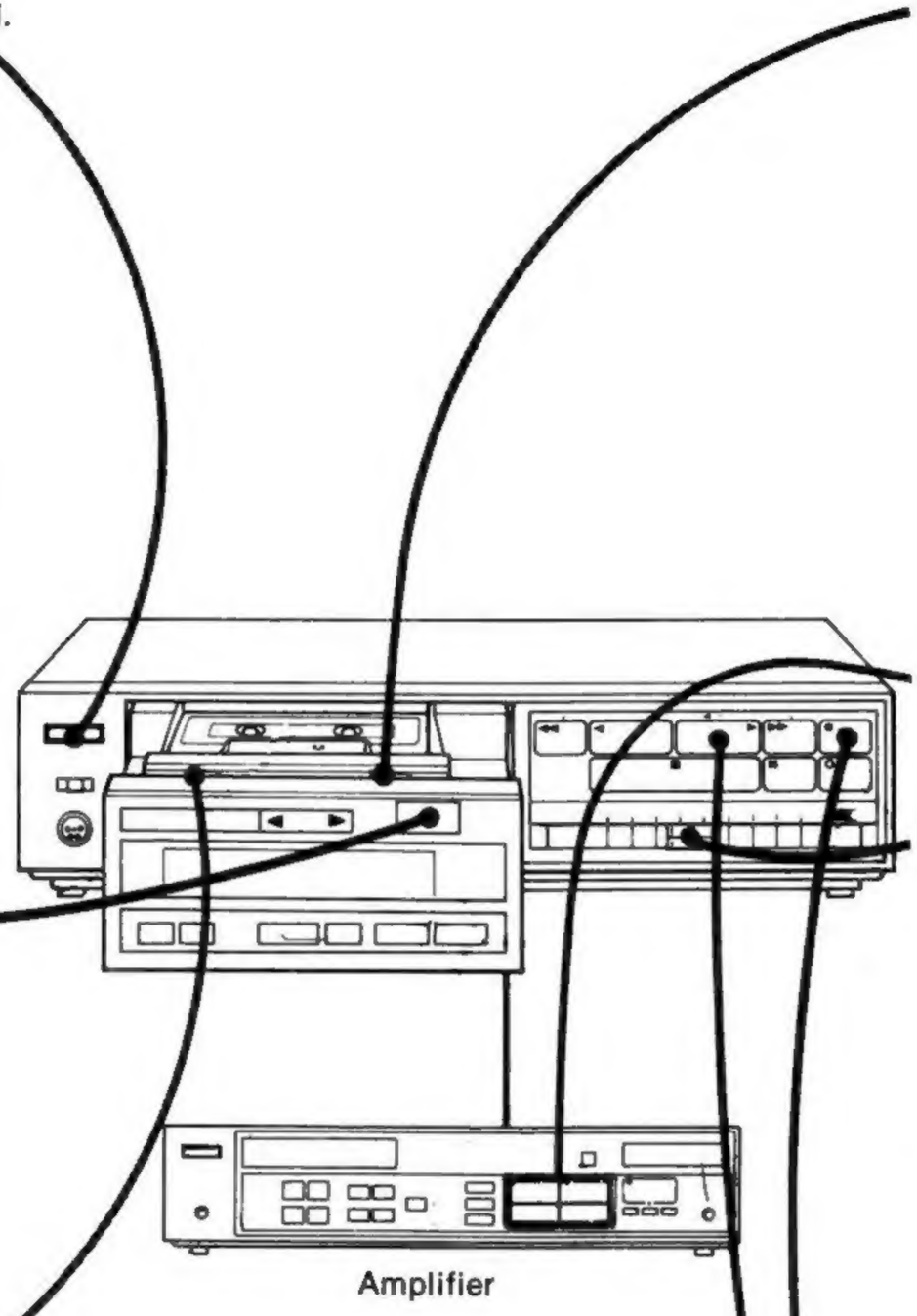
RECORDING

It is only possible to record on the upper side of the cassette.

TO RECORD
The numbers in this diagram indicate the sequence to be followed.

1 Depress the POWER switch to ON.

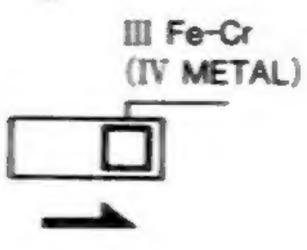
Note
The logic-controlled function keys do not activate until 4 seconds after the POWER switch is turned on. Wait until the ❚❚ indicator goes off.



Amplifier

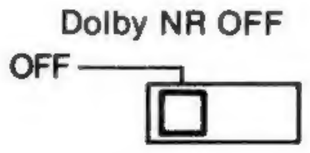
2 Press the ▲ OPEN/CLOSE button and insert a cassette.

3 Check that the tape type indicator corresponds to the type of tape inserted. Set the TAPE SELECT switch to III Fe-Cr (IV METAL) when using a TYPE III (Fe-Cr) cassette or a TYPE IV (METAL) cassette which has no METAL tape detector slots. See "Automatic tape select system" on page 10.

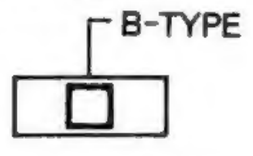


4 Select the Dolby NR system.

Dolby NR OFF



Dolby B-type NR ON



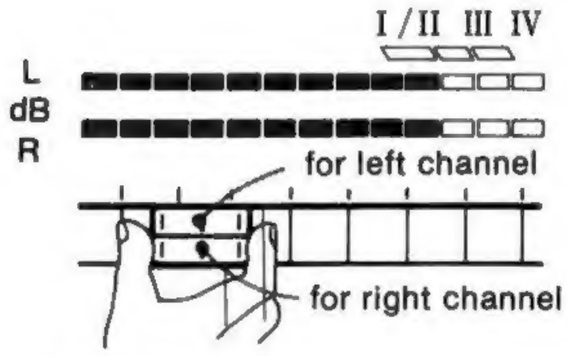
Dolby C-type NR ON

5 Play the program source.

6 Adjust the recording level.

1 Press the ● REC key.

2 Slide the REC LEVEL controls.



Adjust the recording level so that the meters deflect within the proper setting level range on the meter scale. The proper setting level differs with different types of tape. For details, see "To adjust the recording level" on page 11.

7 While holding the ● REC key down, press the ► key. Recording will begin.

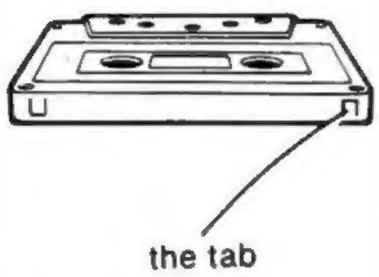
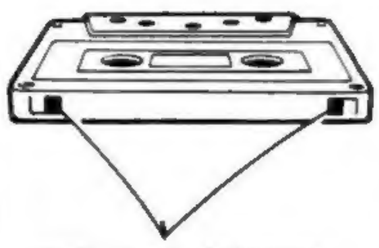
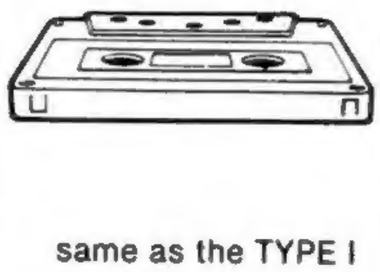
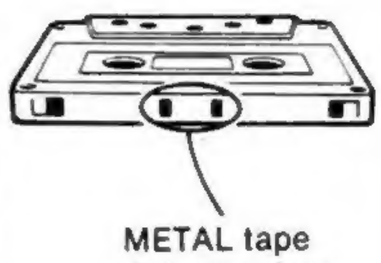
Note: It is not possible to record on the lower side of a cassette.
To record on this side, turn the cassette over.

Note on the TIMER switch
If the power is turned on when this switch is set to the REC or PLAY position, recording or playback will start automatically in 4 seconds. To avoid accidental erasure of previously-recorded material, check that the TIMER switch is set to OFF before turning on the POWER switch.

ISS (Interference suppress switch)
If interference is encountered while recording MW or LW programs, use the ISS switch on the bottom to suppress the interference. First be sure to turn the power off, then slide the switch to 1 or 2 position, depending on which best reduces the noise.

AUTOMATIC TAPE SELECT SYSTEM

With the TAPE SELECT switch at the AUTO position, this automatic tape select system is actuated by the detector slots of certain cassettes and automatically sets the optimum recording and playback characteristics. The tape type detected will be shown by the indicator.

	TYPE I (NORMAL) cassette	TYPE II (CrO_2) cassette	TYPE III (Fe-Cr) cassette	TYPE IV (METAL) cassette	
Tape detector slots	 the tab	 CrO_2 tape detector slots	 same as the TYPE I cassette	 METAL tape detector slots	 METAL tape which has no METAL tape detector slots
Tape type indicator	I NORM II CrO_2 III Fe-Cr IV METAL	I NORM II CrO_2 III Fe-Cr IV METAL	I NORM II CrO_2 III Fe-Cr IV METAL	I NORM II CrO_2 III Fe-Cr IV METAL	I NORM II CrO_2 III Fe-Cr IV METAL

Note

As shown in the above illustrations, when inserting TYPE III (Fe-Cr) cassettes and TYPE IV (METAL) cassettes which have no METAL tape detector slots, the correct tape type indicator does not light up and the automatic tape select system cannot work properly.
Set the TAPE SELECT switch to the III Fe-Cr (IV METAL) position when using these cassettes.
When no cassette is in the holder, no indicator lights up.

Tape list (for Canada)

Tapes (C-46 ~ C-90)		Type of tape
SONY : LNX, SHF, HFX MAXELL : UD, XL I, XL I-S SCOTCH : MASTER I	AMPEX : GRAND MASTER I FUJI : FX-I MEMOREX : MRX-1 TDK : AD, AD-X	TYPE I (NORMAL)
SONY : UCX-S, UCX MAXELL : XL II, XL II-S SCOTCH : MASTER II	AMPEX : GRAND MASTER II FUJI : FX-II MEMOREX : HIGH BIAS II TDK : SA, SA-X	TYPE II (CrO_2)
SONY : FeCr SCOTCH : MASTER III	BASF : PROFESSIONAL III	TYPE III (Fe-Cr)
SONY : METALLIC	Other metal tapes	TYPE IV (METAL)

Tape list (for other countries)

Tapes (C-46 ~ C-90)		Type of tape
SONY : AHF, BHF, CHF BASF : LH-X, Professional I MAXELL : UD, XL I, XL I-S SCOTCH : MASTER I	AGFA : SUPER FERRO DYNAMIC FUJI : FX-I PHILIPS : SUPER FERRO-I TDK : AD, AD-X	TYPE I (NORMAL)
SONY : UCX-S, UCX BASF : Professional II MAXELL : XL II, XL II-S SCOTCH : MASTER II	AGFA : STEREO CHROM FUJI : FX-II PHILIPS : CHROMIUM TDK : SA, SA-X	TYPE II (CrO_2)
SONY : FeCr BASF : Professional III SCOTCH : MASTER III	AGFA : CARAT PHILIPS : FERRO CHROMIUM	TYPE III (Fe-Cr)
SONY : METALLIC	Other metal tapes	TYPE IV (METAL)

MORE ACCURATE RECORDING STARTS

You can use the ❚❚ PAUSE key to start recording more accurately than is possible when recording is started by pressing both the ● REC key and the ► key.

1 After completing step 5 on page 9, press the ❚❚ PAUSE key.
2 Hold the ● REC key down and press the ► key.
3 Adjust the recording level.
4 At the moment you wish to start recording, you need only press the ❚❚ PAUSE key again.

TO RECORD MATERIAL ONTO A SPECIFIC PORTION OF TAPE

When you want to re-record a specific portion of tape or to insert new material between two points on a tape you will find it handy to be able to change directly from the playback to the record mode by pressing the ● REC key while holding the ► key down.

TO ADJUST THE RECORDING LEVEL

Adjust the recording level while reading the input level of the program source to be recorded on the peak level meters.
The proper setting level for the four types of tape is indicated on the top of the meter scale. Simply make sure that the highest signal level of the program falls within the proper setting level range, depending on which type of tape is being used.
The recording level should be set as high as possible while still avoiding distortion, and this will depend on the type of tape being used.
If the meters deflect continuously to full scale, the setting is too high and the recording will be distorted.
If the meters deflect only to about −10 dB, the setting is too low and the recording will be noisy.
However, when recording programs containing many strong, sharp pulses, the recording level may be too high if adjusted in this way. Consideration has to be given to the program source to be recorded, as well as to the characteristics of the cassette to be used, since each cassette, even cassettes with the same type tape, may have different characteristics.

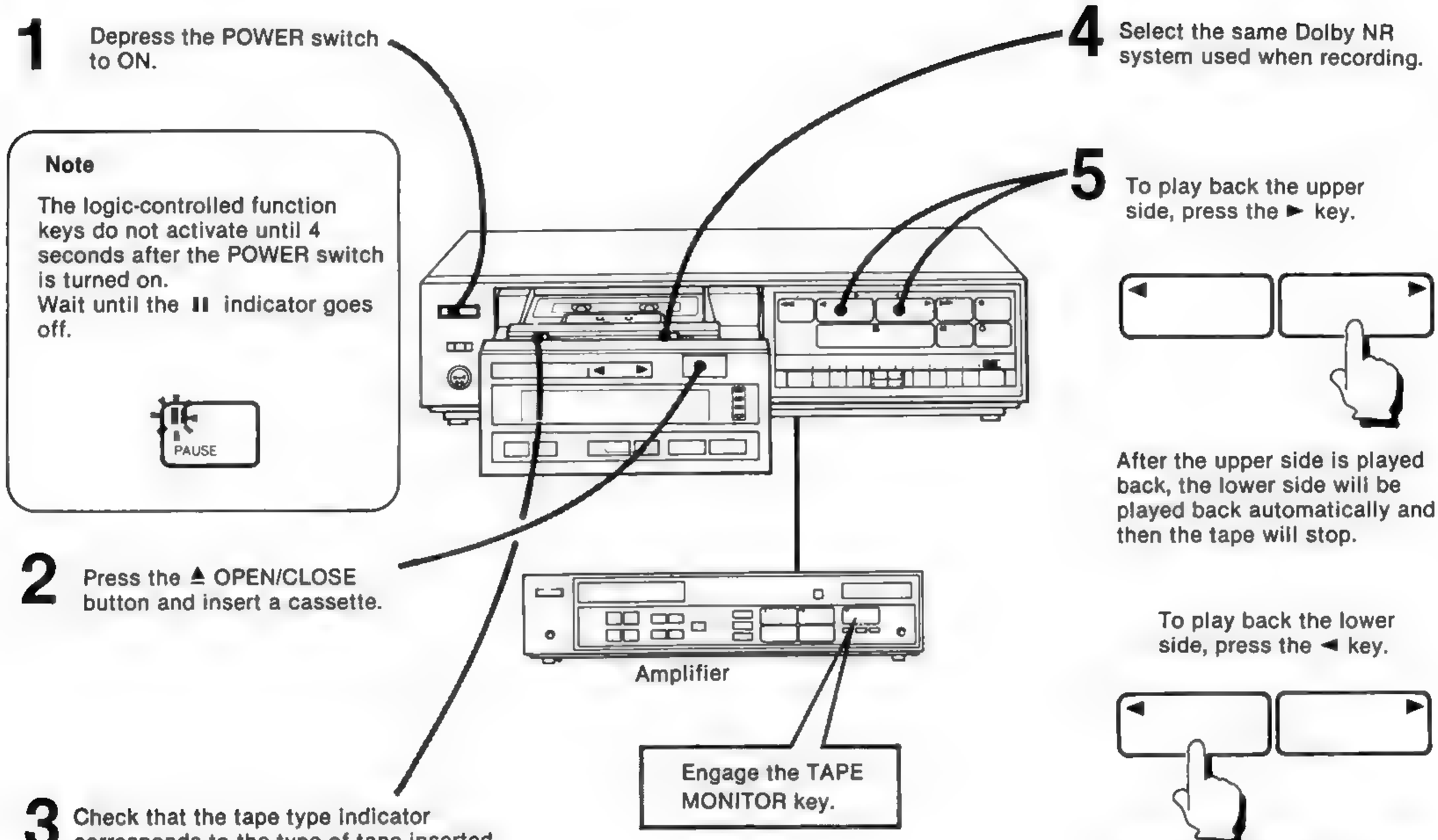
The following table will provide you with a starting point in setting the recording level of various kinds of programs when using Sony cassettes.

Type of tape	Sony cassettes	Low and mid freq. range programs (vocal, etc.)	Mid and high freq. range programs (piano, guitar, etc.)
TYPE I	CHF, LNX	0 dB	− 2 dB
	BHF, HFX	+ 3 dB	+ 1 dB
	AHF, SHF	+ 4 dB	+ 2 dB
TYPE II	UCX	+ 3 dB	+ 2 dB
TYPE III	FeCr	+ 5 dB	+ 1 dB
TYPE IV	METALLIC	+ 6 dB	+ 6 dB

Note
The peak level meters show the input level during recording and the recorded level during playback. If the recording is distorted at high input levels, when the recording is played back the meters will indicate these distorted passages as levels lower than the actual input levels.

PLAYBACK

The numbers in this diagram indicate the sequence to be followed.



AUTO-REVERSE PLAYBACK

When the tape reaches the end of either the upper side or the lower side of the cassette during playback, the roto-bilateral record/playback head reverses the position and the other side will be played back automatically. When the tape reaches the end of the other side, it will automatically stop.
With the ⟲ cycle key is engaged, both sides of the cassette is played back five times in succession.*

CYCLE PLAY

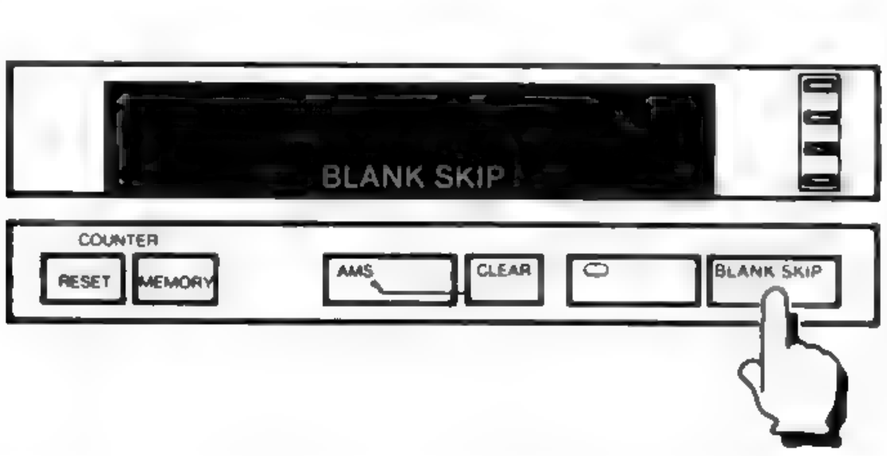
When the ⟲ cycle key is pressed and the ⟲ indicator lights up in the display window, both sides of the cassette are played back five times.*

If you stop the tape during cycle play then restart it, playback will be repeated five times from that point.
To cancel cycle play, press the ⟲ cycle key again.
The ⟲ indicator will go off.
This function can be used with the blank skip function.

* If cycle play is activated during playback of the lower side of the cassette, the tape will stop at the end of the 5th playback of the lower side so that the upper side will be played back only four times.

BLANK SKIP

When the BLANK SKIP key is pressed and the BLANK SKIP indicator lights up in the display window, blank spaces 10 seconds long and longer are skipped during playback. When there is such a blank, the deck will automatically go into the fast-forward or fast-reverse mode, and will resume playback when a new selection begins.
If the tape reaches the end of one side in the fast-forward or fast-reverse mode, the head reverses and the fast-forward or fast-reverse mode will continue until a new selection begins on the other side.



AUTOMATIC MUSIC SENSOR (AMS)

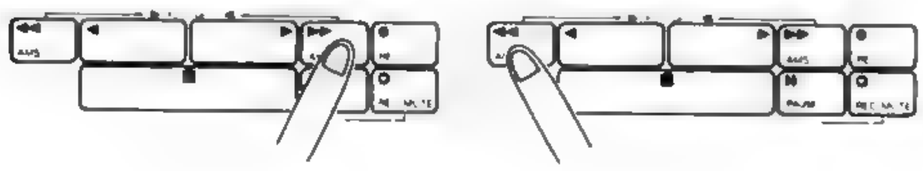
The Automatic Music Sensor locates the program selection you desire by skipping ahead or going back past others in the fast-forward or fast reverse mode, and plays back the selection automatically.
The AMS works by counting the blank spaces between selections of either the upper side (when ► is illuminated) or lower side (when ◄ is illuminated) of the cassette.

AMS operation

1 Press the AMS key to set the number of selections to skip. See "How to count the blank spaces".

2 To locate a selection ahead:
When the ► indicator is on, press the ►► key.
When the ◄ indicator is on, press the ◄◄ key.

To locate a previous selection:
When the ► indicator is on, press the ◄◄ key.
When the ◄ indicator is on, press the ►► key.



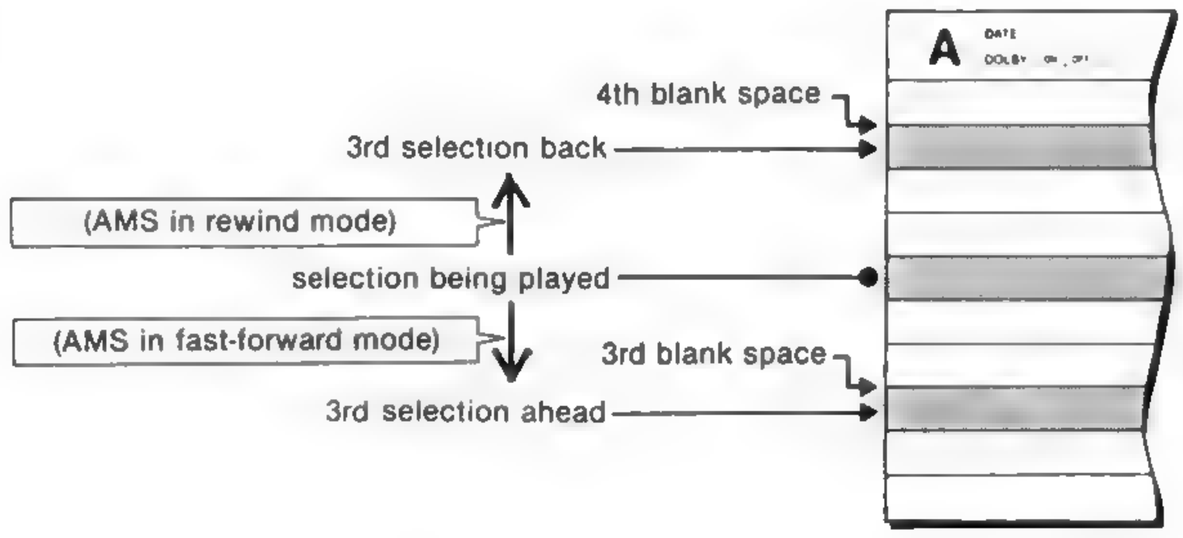
The AMS can locate a selection as far ahead as 9 selections or as far back as 8 selections. You can increase this capacity even further by pressing the AMS key when the AMS is in mid-search and has already passed a number of selections.

Note

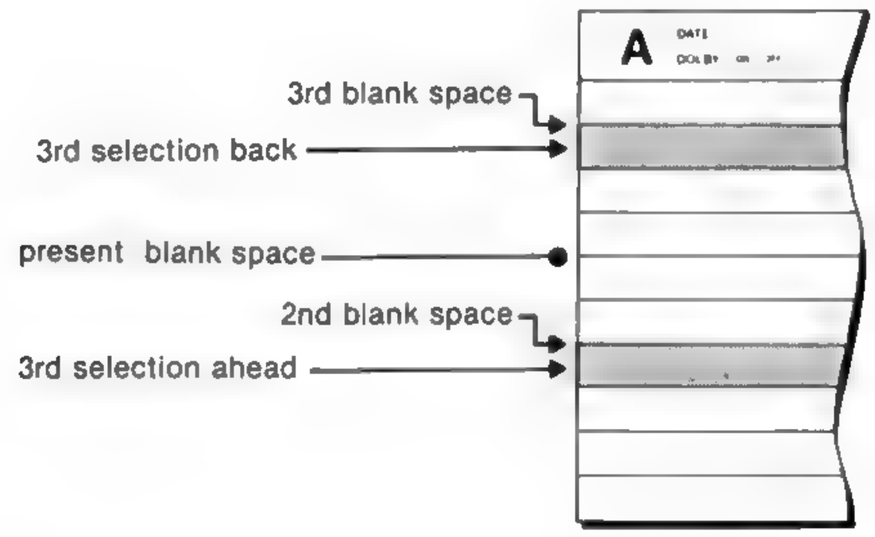
Do not press the AMS key and the ▲ OPEN/CLOSE button or one of the keys on the cassette module simultaneously.

How to count the blank spaces

The number to be set in the display window by pressing the AMS key is the number of blanks from the present position to the blank preceding the desired selection.
To locate the 3rd selection ahead from the selection being played, for example, set the number "3" in the display window so that the AMS finds the 3rd blank space. To locate the 3rd selection back, set "4," so that the AMS finds the 4th blank space.



If the present tape position is at one of the blank spaces, that blank space should not be counted when you set the AMS program.



To cancel AMS operation

Press the CLEAR key. The AMS indicator will go out.

To assure AMS operation on recorded tape

Since AMS works by searching out the blank spaces on a tape, it may not operate if there is noise in the space between selections, or if the space is too short to be detected.
The record muting facility of this tape deck can make a four second blank space that will assure AMS operation on any recorded tape.

Note on AMS operation

If the recorded music includes a long pause, or if it continues for a time at sufficiently low volume, as may happen for instance with classical music, the AMS will treat this space as a blank.

Using a remote control unit

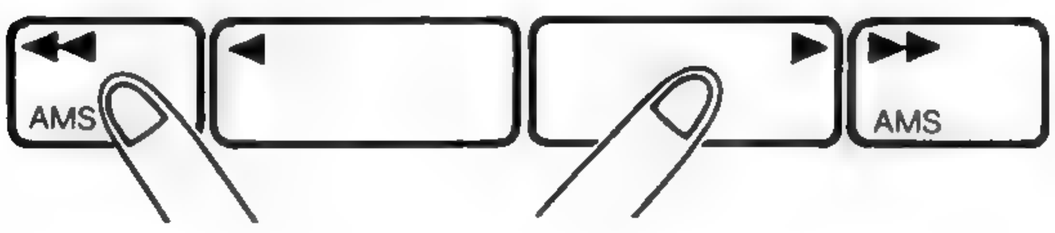
The ● REC MUTE button of the RM-70 remote control unit or the RM-V70 Remote Commander has the same function as the AMS key in the AMS operation. You can set the appropriate number in the display window remotely by pressing the ● REC MUTE button of the remote control unit or Remote Commander.

AUTO PLAY AND MEMORY STOP/PLAY

AUTO PLAY—To start playback from the beginning after rewinding

1 If the AMS and MEMORY indicators are displayed, press the CLEAR and MEMORY keys to disengage those functions.

2 When rewinding the tape, press the ► and ◄◄ keys* simultaneously.

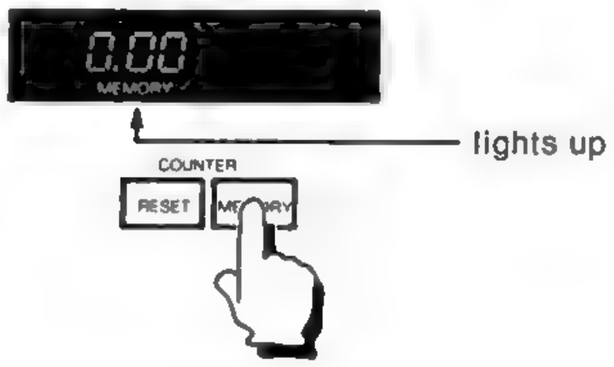


After the tape is completely rewound, the tape will automatically replay.

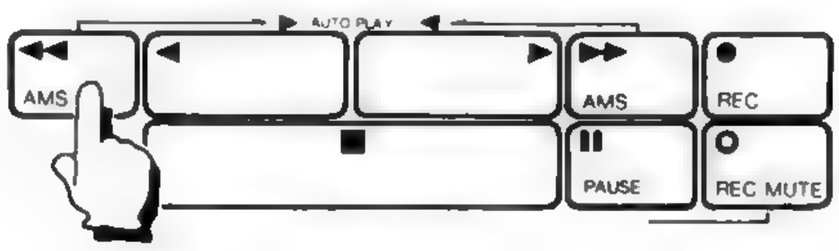
MEMORY STOP—To stop the tape at a particular point after rewinding

1 If the AMS indicator is displayed, press the CLEAR key to disengage the function.
2 Start playback or recording.
3 At the desired point on the tape, press the COUNTER RESET key to set the tape counter to 0.00.

4 Press the MEMORY key so that the MEMORY indicator lights up.



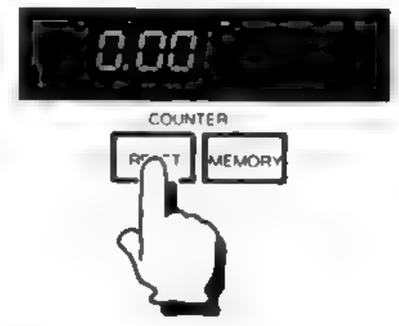
5 When rewinding the tape, press the ◄◄ key*



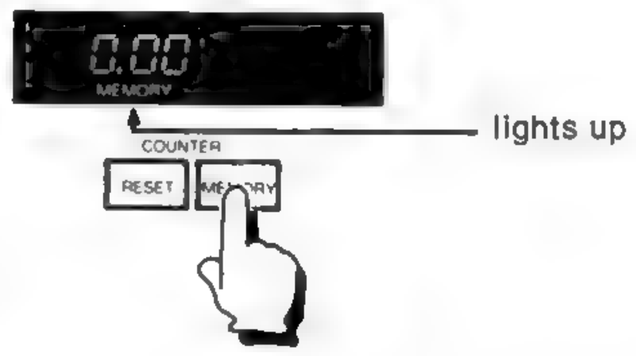
The tape will automatically stop at the 0.00 point.

MEMORY PLAY—To start playback from a particular point after rewinding

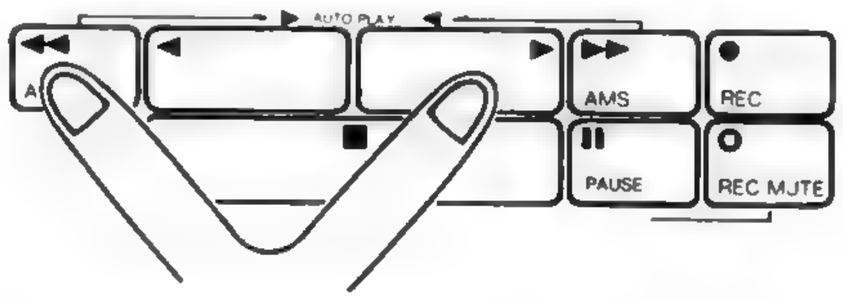
1 If the AMS indicator is displayed, press the CLEAR key to disengage the function.
2 Start playback or recording.
3 At the desired point on the tape, press the COUNTER RESET key to set the tape counter to 0.00.



4 Press the MEMORY key so that the MEMORY indicator lights up.



5 When rewinding the tape, press the ► and ◄◄ keys* simultaneously.



The tape will replay automatically after rewinding to the 0.00 point.

* You can operate "Auto play", "Memory stop" and "Memory play" during playback of the lower side of the cassette (when the ◄ indicator is on.) Simply change the above procedure as follows:

Press the ► and ◄◄ keys. → Press the ◄ and ►► keys.
Press the ◄◄ key. → Press the ►► key.

Why does the tape stop around −0.01?
—In order to avoid cutting off the starting point.

How does one rewind the tape further than 0.00?
—Press the ◄◄ or ►► key again.

When sould one press the MEMORY key?
—Any time. If the MEMORY indicator is displayed, the tape will stop or replay automatically at the 0.00 point.

USING THE DIGITAL LINEAR COUNTER

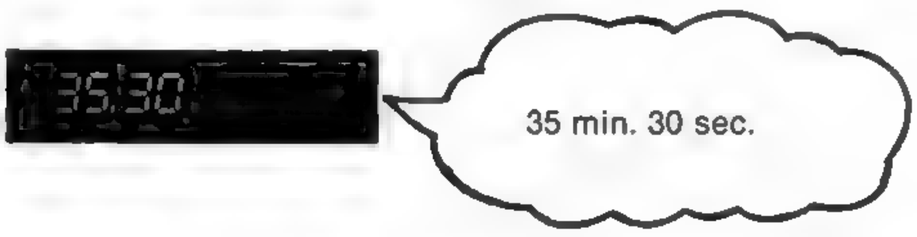
The first two digits of this tape counter show the approximate recording or playback time in minutes, and the last two digits show the seconds.

TO INDEX THE WHOLE TAPE

Before recording or playback, set the counter to 0.00 by pressing the COUNTER RESET key.
As the tape runs, the figures of the counter change. Note the numbers and the program being recorded or played back. Any point of the tape can thus be readily located later by reference to these numbers.

TO VERIFY THE AMOUNT OF RECORDING TIME POSSIBLE ON ONE SIDE OF A CASSETTE

At the beginning of the tape, set the counter to 0.00 and run the tape "fast-forward" to the end. The digits on the counter will show the approximate available recording time.



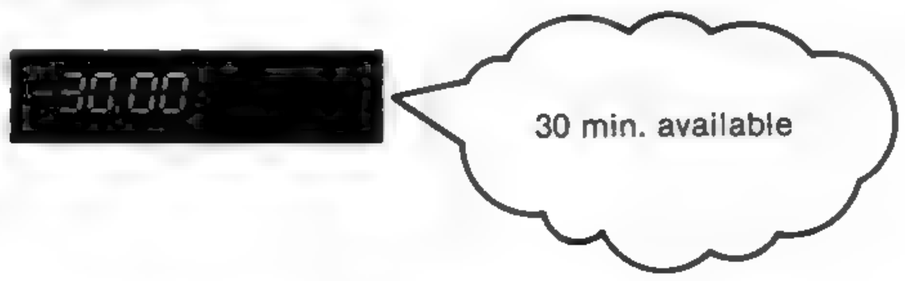
TO DETERMINE THE REMAINING RECORDING TIME

Stop the tape at the point at which you wish to begin recording later. Set the counter to 0.00 and run the tape "fast-forward" to the end. The digits on the counter will show the approximate recording time still remaining.

●To rewind the tape to 0.00 and start recording automatically, use the "memory stop" function described on page 14.

TO MONTIOR THE REMAINING RECORDING TIME WHILE RECORDING—Using the minus display

This counter shows the recording or playback time from the 0.00 point with a minus sign in front of the digits when the tape is rewound beyond 0.00.
Before recording, move the tape "fast-forward" to the end, then set the counter to 0.00, and rewind the tape to the beginning. The digits on the counter will show the approximate recording time on one side of the cassette.



The digits will change from −30.00 to −29.59, −29.58 ... as the recording goes on, and you can monitor the remaining recording time at any point on the tape.

COUNTER INDICATION DURING THE REVERSE PLAY

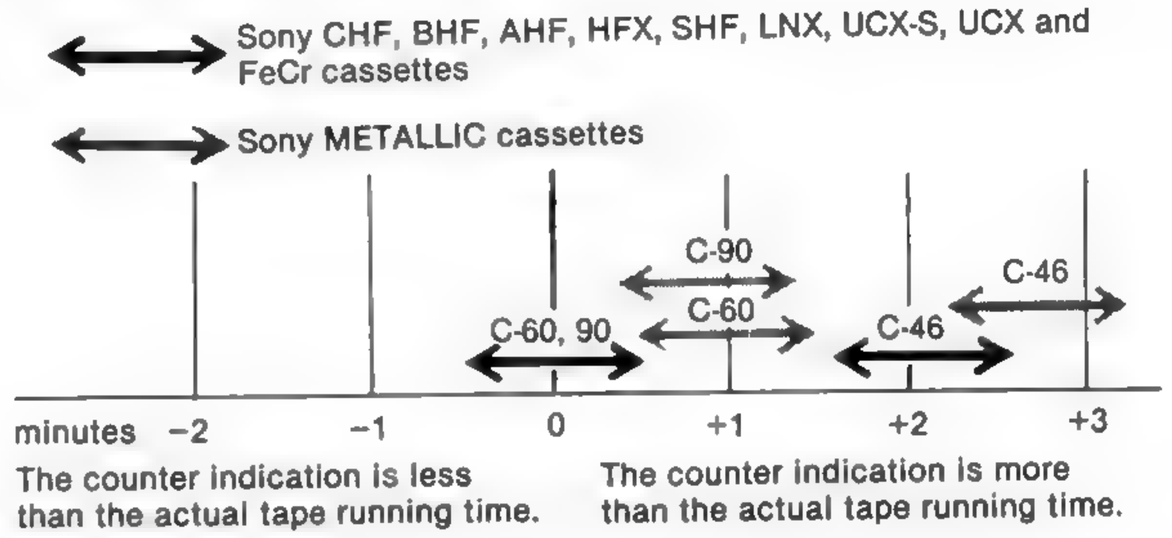
During playback of the lower side of the cassette (when the ◄ indicator is on), the digits on the counter will be counted down as the tape advances.

Note
Do not turn off the power while measuring the time because the numbers will return to 0.00 when the power is turned on again.

THE ACCURACY OF THE COUNTER

This counter is not actually a digital clock, so that the displayed figures are not exactly equal to the actual elapsed time. The accuracy will vary depending on the type of tape being used.
This counter has been designed using C-60 cassettes as the standard. Make sure that the displayed time is greater than the time required, when using a C-46 cassette.

Difference between the counter indication and actual running time on one side of a cassette



ERASING

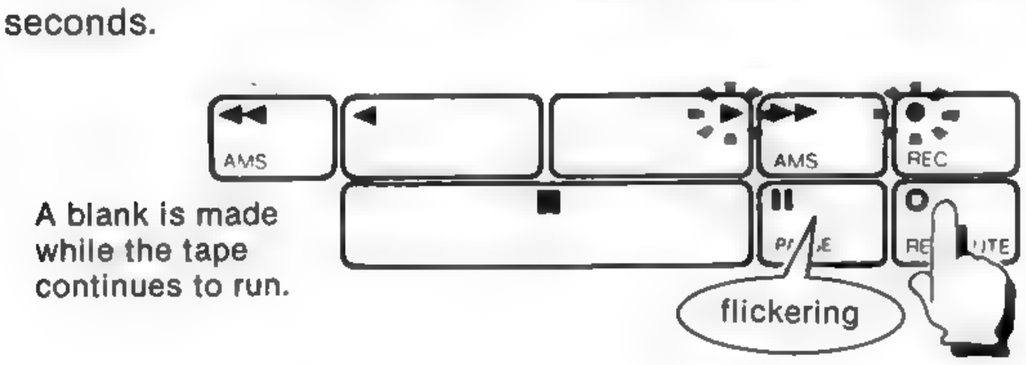
When the tape deck functions in recording mode, the erase head automatically erases any previously recorded material.
To erase without recording :

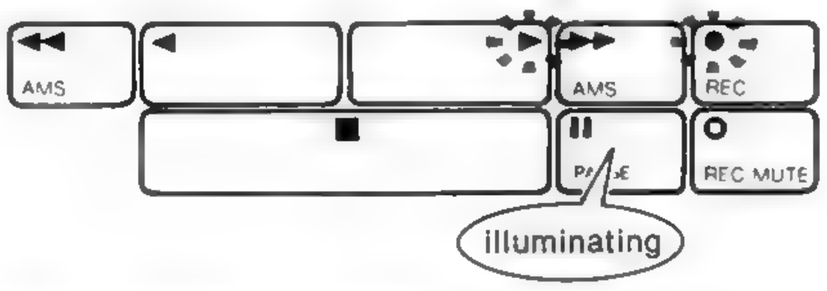
1 Make sure that the safety tab of the cassette is in place, or that the tab slot is covered with plastic tape.
2 Set the REC LEVEL controls fully to "0". (Disconnecting all inputs will result in a more complete erasure.)
3 Insert the cassette to be erased and check that the tape type indicator corresponds to the type of tape inserted. Set the TAPE SELECT switch to the $^{\text{III Fe-Cr}}_{\text{(IV METAL)}}$ position if the indicator and the tape do not correspond.
4 While holding the ● REC key down, press the ► key.

RECORD MUTING

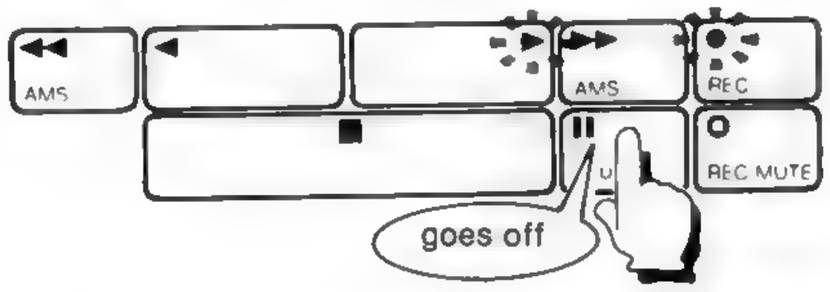
By pressing the ● REC MUTE key during recording, four seconds interspacing is provided automatically, eliminating unwanted program material such as broadcasting commercials. While the record muting is operating, the incoming signal is not recorded on the tape but it continues to register on the meters and feed to the monitor so that you know exactly what is going on.

1 Press the ● REC MUTE key when the segment you do not want to record begins. The ❚❚ indicator of the PAUSE key will blink, and the tape path will pause automatically after four seconds.





2 When you want to resume recording, press the ❚❚ PAUSE key.



To insert a blank less than four seconds long
Press the ● REC MUTE key to mute recording. Press the ❚❚ PAUSE key when you want to resume recording.

To insert a blank over four seconds long
Hold down the ● REC MUTE key for as long as you want the blank segment on the tape to be. After four seconds, the ❚❚ indicator of the PAUSE key will blink more rapidly. When you release the ● REC MUTE key, the tape deck will be in the pause mode. When you want to resume recording, press the ❚❚ PAUSE key to release the pause mode.

TIMER-ACTIVATED RECORDING AND PLAYBACK

By connecting any commercially available timer to the tape deck, the deck can be set to play back or record automatically at any desired time. As timers work in different ways, be sure to read the timer's instruction manual carefully.

To record a broadcast using a timer
1 Connect the tape deck, amplifier, tuner and timer. Set the timer so that power is supplied to the connected equipment.
2 Turn on the amplifier and tuner and tune in the station which will broadcast the program you want to record.
3 Set the tape deck's TIMER switch to OFF.
4 Insert a cassette with the side to be recorded upwards. Make sure that the tab is intact or that plastic tape covers the tab slot.
5 Turn on the tape deck and adjust the recording level.
6 Set the timer for the desired time. (At this point power to the connected equipment will be cut off.)
7 Set the tape deck's TIMER switch to REC.
The tape deck is now ready to start recording at the time set on the timer. The recording will stop at the end of the upper side of the cassette.

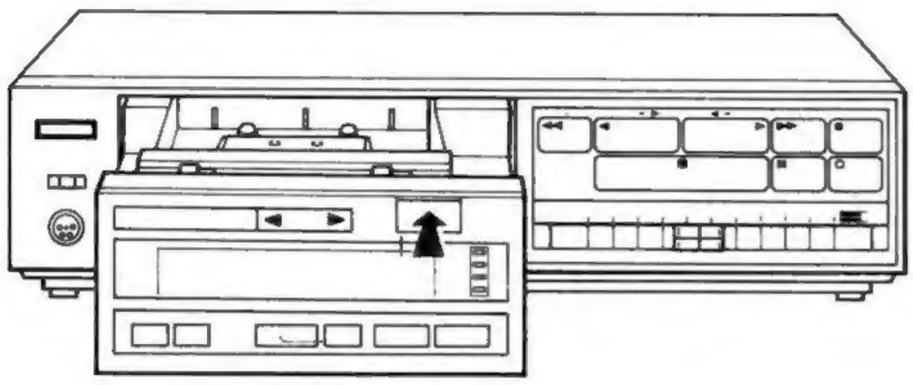
To play back using a timer
The connections between equipment are the same as for recording using a timer.
1 Set the tape deck's TIMER switch to OFF.
2 Turn on the amplifier and set the appropriate switches for playback.
3 Turn on the tape deck and insert the recorded cassette.
4 Press the ► or ◄ key, depending on which side of the cassette you want to play back first.
5 Set the timer for the desired time. (At this point power to the connected equipment will be cut off.)
6 Set the tape deck's TIMER switch to PLAY. The tape deck is now ready to start playback at the time set on the timer.

Note
The tape deck's TIMER switch will function properly only if the tape deck is turned on **after** the switch is set to REC or PLAY. If you want to change the setting of the switch, turn the power off first. Do not change the setting of the TIMER switch during the four second stand-by period immediately after the power is turned on.

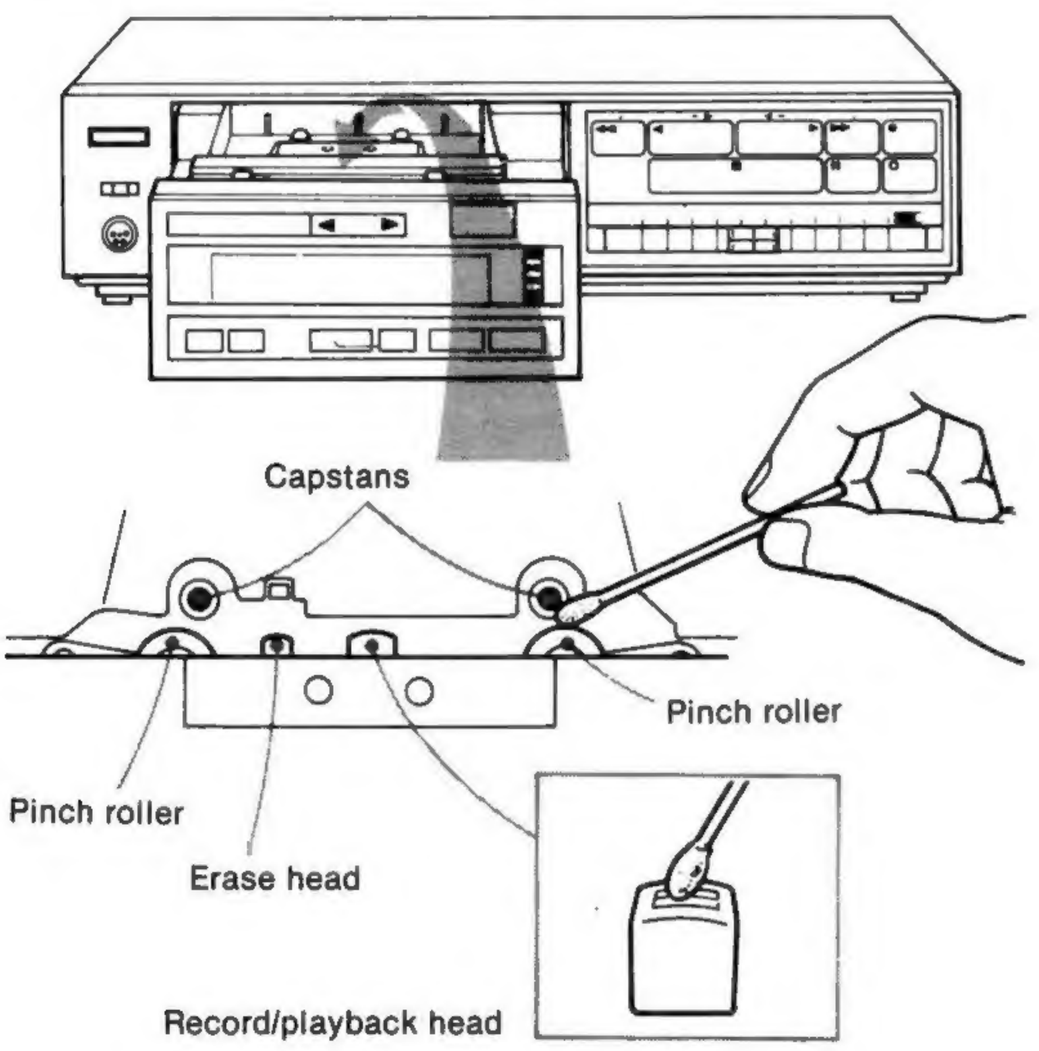
MAINTENANCE

Cleaning of heads and tape path
We recommend cleaning after every 10 hours of operation. To make the best possible recordings, however, you should clean all surfaces over which the tape travels before every recording.

1 Press the ▲ OPEN/CLOSE button to open the cassette module. Remove the cassette.



2 Wipe the heads, the pinch rollers and the capstans with a cleaning tip slightly moistened with cleaning fluid or alcohol.



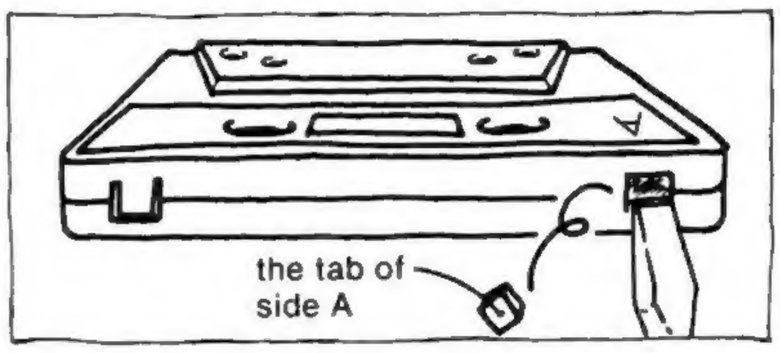
After cleaning the heads and tape path, do not insert a cassette until the areas cleaned are completely dry.

Demagnetizing heads
After 20 to 30 hours of use, enough residual magnetism will have built up on the heads to begin to cause loss of high frequencies and hiss. At this time you should demagnetize the heads and all metal parts in the tape path with a commercially available head demagnetizer. Be sure that the tape deck is turned off while you demagnetize.

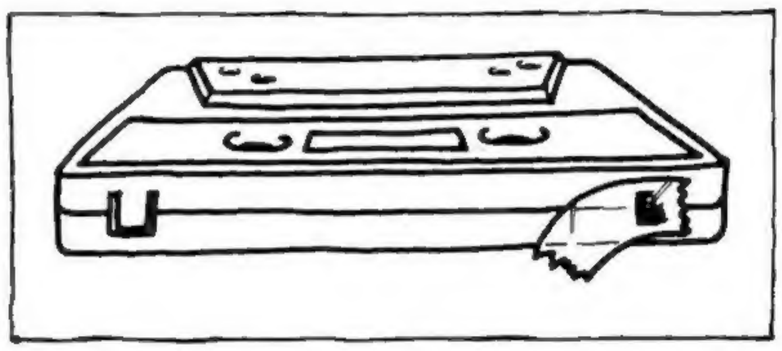
Cleaning the cabinet
Clean the cabinet, panel and controls with a soft cloth lightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

NOTES ON CASSETTES

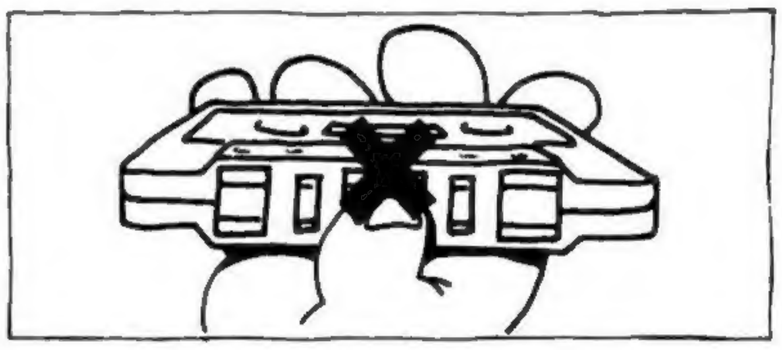
To protect cassettes from accidental erasure
Remove the tab as illustrated so that the record mode does not function when the record key is pressed.



To record on a cassette once tabs have been removed, simply cover the slot with plastic tape.

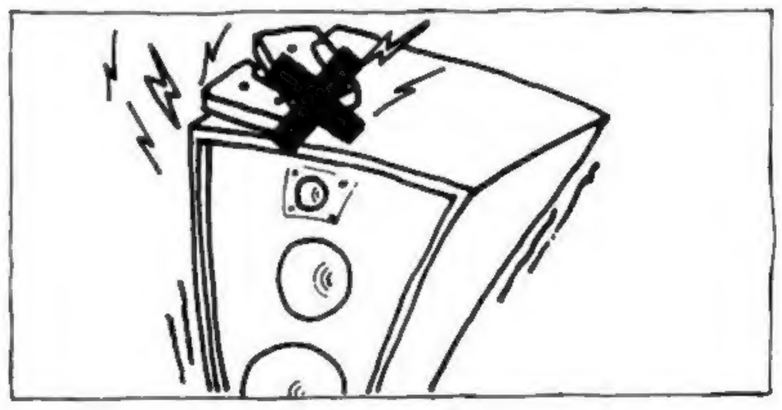


Cassette care
● Avoid touching the tape surface of a cassette, as any dirt or dust will contaminate the heads.



● Do not stick thick labels or tape on the cassette, as this may affect proper cassette alignment and prevent the tape from making proper contact with the heads.

● Keep cassettes away from equipment with magnets, such as speakers and amplifiers, because their magnets could cause erasures or distortions of your recorded tapes.



● Protect cassettes from dust by storing them in their cases. Even minor dirt or dust could contaminate the heads, resulting in noise and sound drop-outs.

● Do not expose cassettes to direct sunlight, extremely cold temperature or moisture.

● Avoid fast-winding just before storing cassettes, as this may stretch the tape edge if the cassettes are left unused over a period of time.

DOLBY NR (NOISE REDUCTION) SYSTEM

There have been until recently just two types of Dolby NR system: the A-type for professional use, and the B-type, a simplified version of the A-type, employed by most consumer-grade cassette decks. Now, a third type of Dolby NR system is available, the C-type. The C-type system reduces tape noise much more effectively than the B-type system.

The basis of the Dolby NR system
During recording, low-level high-frequency signals, which tend to be obscured by tape hiss, are boosted so that they are substantially higher in level than any tape noise. When these signals are played back, the level is lowered to the original input level, while simultaneously the level of any tape noise is reduced to the same extent.
The Dolby B-type NR system thus reduces tape noise by 10 dB at 5 kHz. The C-type system reduces noise by 20 dB at 5 kHz. The Dolby C-type NR system also begins to take effect at frequencies lower than the B-type system.

Anti-saturation network
Normally, recording tape will saturate more easily at the higher frequencies. The Dolby C-type NR system incorporates a high frequency anti-saturation network. During recording, the anti-saturation network automatically reduces high-level high-frequency signals. When these signals are played back, the level is automatically boosted to the original input level. At 10 kHz, the tendency of the tape to saturate is reduced by 4 dB by the use of this network.

Playback of Dolby NR encoded tapes
For the best sound, lowest distortion, and most effective noise reduction, it is essential that a tape recorded using either the B-type or the C-type Dolby NR system be played back using the same system that was used during the recording process. We recommend that you label the cassettes you record as being either non-Dolby NR, Dolby B NR, or Dolby C NR.

Fig. 1 Encoding characteristics

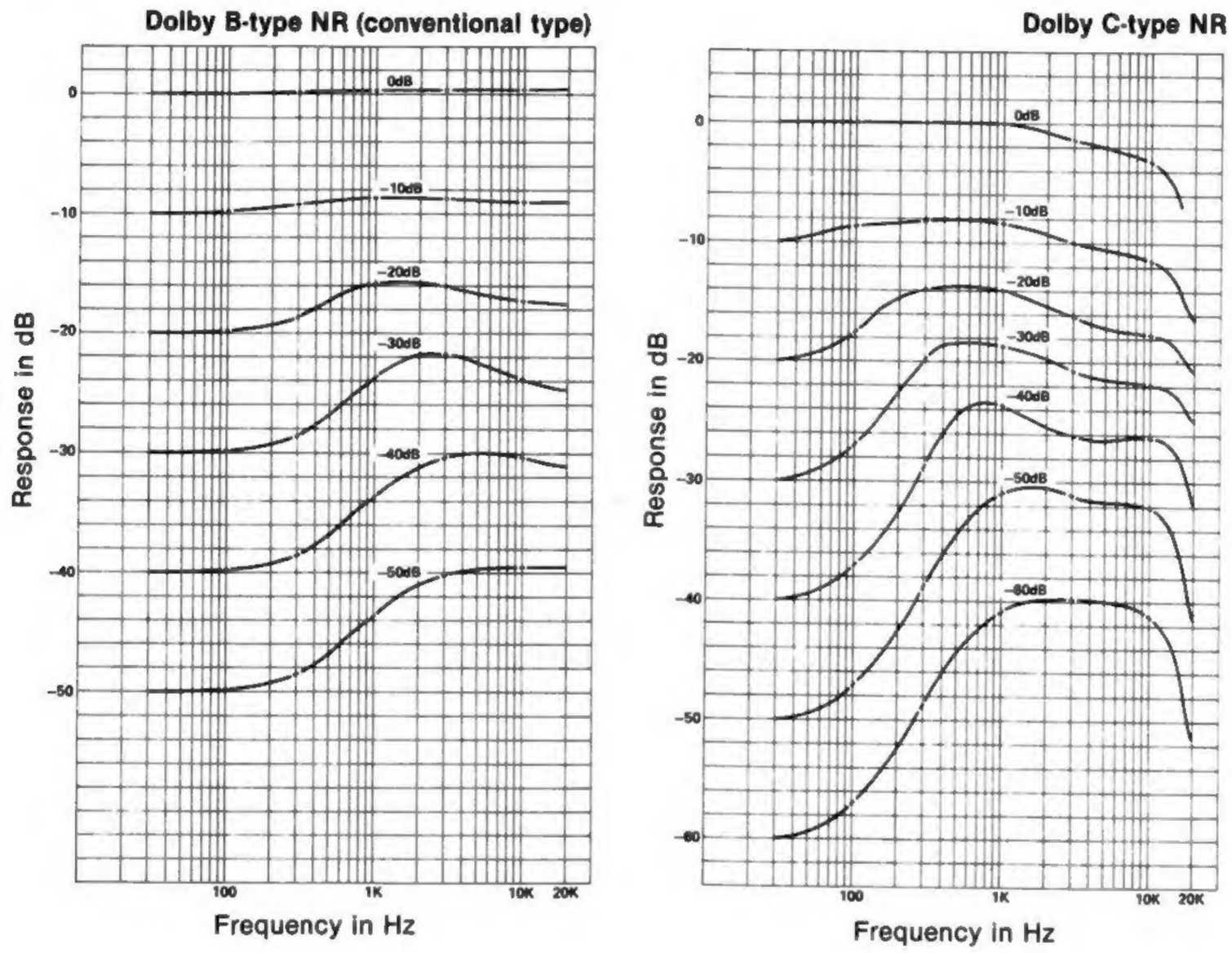


Fig. 2 Noise Improvement

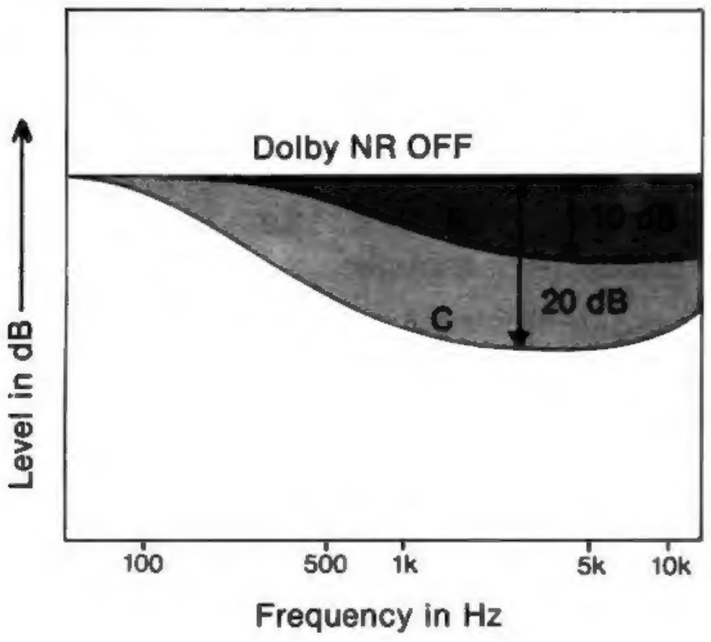
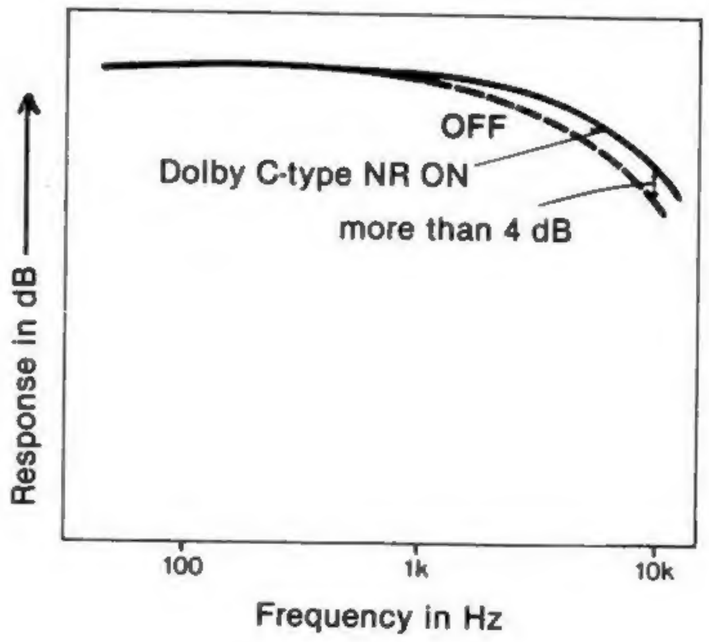


Fig. 3 Saturation level improvement



SPECIFICATIONS

Recording system 4-track 2-channel stereo
Fast-forward and rewind time
Approx. 100 sec. (with C-60 cassette)
Bias frequency 105 kHz
Signal-to-noise ratio (NAB, at peak level)

Cassette / Dolby NR switch	OFF	B-TYPE ON	C-TYPE ON
TYPE IV (Sony METALLIC)	58 dB	65 dB	71 dB
TYPE III (Sony FeCr)	59 dB	66 dB	72 dB
TYPE II (Sony UCX)	57 dB	64 dB	70 dB
TYPE I (Sony BHF or HFX)	54 dB	61 dB	67 dB

Total harmonic distortion
1.0% (with Sony METALLIC and FeCr cassettes)
Frequency response DOLBY NR OFF
- With TYPE IV cassette (Sony METALLIC)
  20 – 17,000 Hz
  30 – 15,000 Hz (±3 dB)
  30 – 13,000 Hz (±3 dB, 0 VU recording)
  30 – 15,000 Hz (DIN)
- With TYPE III cassette (Sony FeCr)
  20 – 16,000 Hz
  30 – 15,000 Hz (±3 dB)
  30 – 15,000 Hz (DIN)
- With TYPE II cassette (Sony UCX)
  20 – 16,000 Hz
  30 – 15,000 Hz (±3 dB)
  30 – 15,000 Hz (DIN)
- With TYPE I cassette (Sony BHF or HFX)
  20 – 15,000 Hz
  30 – 14,000 Hz (DIN)

Wow and flutter 0.065% WRMS (NAB)
±0.2% (DIN)
Inputs Line inputs (phono jacks)
Sensitivity 77.5 mV (–20 dB)
Input impedance 50 k ohms
Outputs Line outputs (phono jacks)
Output level 0.435 V (–5 dB) at load impedance 50 k ohms
Load impedance over 10 k ohms

General
Power requirements Type 1 : 220 V ac, 50/60 Hz
(240 V ac adjustable by authorized Sony personnel)
Type 2 : 240 V ac, 50/60 Hz
(220 V ac adjustable by authorized Sony personnel)
Type 3 : 120 V ac, 60 Hz
Type 4 : 110, 120, 220 or 240 V ac adjustable, 50/60 Hz
AC outlet Type 1 and 3 : 1 unswitched, 100 watts max.
Type 2 : 1 switched, 100 watts max.
Power consumption Type 1 and 2 : 22 watts
Type 3 : 20 watts
Type 4 : 21 watts
Dimensions Approx. 355 × 80 × 280 mm (w/h/d)
(14 × 3¼ × 11⅛ inches)
including projecting parts and controls
Weight Approx. 5 kg (11 lbs 1 oz)
Supplied accessories
Connecting cord (2)
Head cleaning tips (1 set)

While the information given is correct at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in the specifications. We would ask you to check with your appointed Sony dealer if clarification on any point is required.

Note
Appliance conforms with EEC Directive 76/889 regarding interference suppression.

TROUBLE CHECKS

The following trouble checks will help you correct the most common problems encountered with a tape deck. Should any problem persist after you have made these checks, consult your nearest Sony service facility.
Before proceeding with these trouble checks, first check these basic points:

- The power cord must be firmly connected.
- Amplifier connections must be firmly made.
- Heads, capstans and pinch rollers should be clean.
- The amplifier controls and switches should be set correctly.

FUNCTION KEYS AND TAPE TRANSPORT PROBLEMS

The function keys do not activate.

- Logic-controlled function keys operate approximately 4 seconds after the POWER switch is turned on.
- The cassette is not fully inserted.
- No cassette is in the cassette holder.

Recording or playback begins as soon as the POWER switch is turned on.

- The TIMER switch is set at either REC or PLAY.

The ● REC key does not activate.

- The tab has been removed from the cassette.

The automatic shut-off mechanism activates before the end of the tape.

- The tape is slack.
- The memory counter function is in operation.
- This situation may also be caused by a deformed cassette shell.

Tape transport noise seems excessively loud in fast-forward or fast-reverse mode.

- This situation depends upon the cassette used and is not a problem.

RECORDING AND PLAYBACK PROBLEMS

Recording or playback cannot be made or there is a decrease in sound level.

- Contamination or magnetic build-up on the record/playback head.
- Improper connection.
- Improper setting of the amplifier controls.

AMS operation cannot be made.

- A blank space is too short (less than 4 seconds).
- There is noise in the blank space between selections.

Excessive wow or flutter or drop out

- Contamination of the capstan or pinch-roller.

Incomplete erasure

- Contamination of the erase head.

Increase of noise or erasure of high frequencies

- Magnetic build-up on the head.

Unbalanced tone in higher frequencies

- Improper setting of the DOLBY NR switch. When playing back, set the switch to the same position used in recording.
- Improper setting of the TAPE SELECT switch.

Set the TAPE SELECT switch to $^{\text{III Fe-Cr}}_{\text{(IV METAL)}}$ when using a TYPE III (Fe-Cr) cassette or a TYPE IV (METAL) cassette which has no METAL tape detector slots.

NOISE

Hum noise

- The tape deck is stacked on or under the amplifier. Separate the units.